

### Abstract of the Disclosure

An assay stick 7 includes a transparent reaction vessel or tube 14 having one or more microbeads 8 disposed therein. The microbeads 8 have a plurality of unique  
5 identification digital codes based on a diffraction grating 12 disposed therein that are detected when illuminated by incident light 24. The incident light 24 may be directed transversely onto the side or onto an end of the tube 14 with a narrow band (single wavelength) or multiple wavelength source, in which case the code is represented by a spatial distribution of light or a wavelength spectrum, respectively. The assay stick 7  
10 may be reused or disposed upon completion of the assay. Instead of beads, cells or molecules may be spotted or grown directly on the tube.